

**EXHIBIT A**

“Compounds of Silicon” as available at

<http://www.webelements.com/webelements/compounds/text/Si/N4Si3-12033895.html>

For Serial No.: 09/981,402  
Applicant(s): SATOH, Yoshihiro

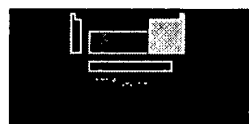


# Chemistry: WebElements Periodic Table: Professional Edition: Silicon: compound data [silicon (IV) nitride]

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Silicium
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Online discussions

**Silicon**

14  
**Si**  
28.0855(3)

## index

Index for silicon

## background

Key data;  
description  
History

## silicon around us

Uses  
Geology  
Biology

## silicon compounds

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Bond enthalpies  
Radii in compounds  
Lattice energies  
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## electronic properties

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Electron affinities  
Electronegativities  
Effective nuclear charges  
Electron binding energies  
Atom radii  
Valence shell radii

## physical properties

Bulk properties  
(density, resistivity, etc.)  
Thermal properties  
(melting point, etc.)

## Compounds of silicon:

### silicon (IV) nitride

- **Formula as commonly written:**  $\text{Si}_3\text{N}_4$
- **Hill system formula:**  $\text{N}_4\text{Si}_3$
- **CAS registry number:** [12033-89-5]
- **Formula weight:** 140.283
- **Class:** nitride

## Synonyms

- silicon (IV) nitride
- silicon nitride
- trisilicon tetranitride

## Physical properties

- **Colour:** grey
- **Appearance:** crystalline solid
- **Melting point:** 1900°C
- **Boiling point:**
- **Density:** 3200 kg m<sup>-3</sup>

## Element analysis and oxidation numbers

For each compound, and where possible, a formal oxidation number for each element is given, but the usefulness of this number is limited, especially so for *p*-block elements in particular. Based upon that oxidation number, an electronic configuration is also given but note that for more exotic compounds you should view this as a guide only.



Thermodynamic  
properties**crystallography**Crystal structure  
[view VR world]  
[view pdb image]**nuclear properties**NMR  
Naturally occurring  
isotopes  
Radioisotopes**Element**    **%**  
**Formal**  
**oxidation state**N    39.94  
Si    60.06-3  
4**Formal electronic**  
**configuration**[He].2s<sup>2</sup>.2p<sup>6</sup>  
[Ne]

Cl

Br

Ic

H

O

Si

S

Te

Ni

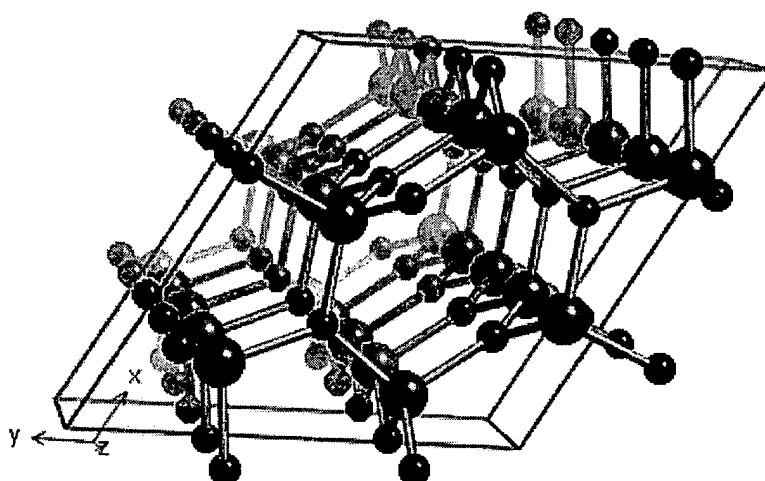
**Synthesis**

Not available

**Solid state structure**

- **Geometry of silicon:** 4 coordinate: tetrahedral
- **Prototypical structure:**

silicon(IV) nitride

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**Isotope pattern**

What follows is the calculated isotope pattern for the Si<sub>3</sub>N<sub>4</sub> unit with the most intense ion set to 100%.

Formula: Si<sub>3</sub>N<sub>4</sub>

mass    %

140	100.0	_____
141	16.7	_____
142	11.1	_____
143	1.2	_____
144	0.4	_____
145	0.0	_____
146	0.0	_____



## Suppliers

Coming soon....

## References


The data on these compounds pages are assembled and adapted from the primary literature and several other sources including the following.

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 WebElements™, the periodic table on the WWW, URL: <http://www.webelements.com/>  
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